

Required Procedures for Respiratory Protection Program

WAC 296-842-220

Summary

YOUR RESPONSIBILITY:

To use the procedures and questionnaire provided in this section when implementing your respiratory protection program

You must

Use this medical questionnaire for medical evaluations WAC 296-842-22005	220-2
Follow these fit-testing procedures for tight-fitting respirators WAC 296-842-22010	200-11
Follow procedures established for cleaning and disinfecting respirators WAC 296-842-22015	200-36
Follow procedures established for seal checking respirators WAC 296-842-22020	200-37

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Summary

RULE WAC 296-842-22005

Use this medical questionnaire for medical evaluations

You must

- Use the medical questionnaire in Table 10 when conducting medical evaluations.



Note:

- You may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.
- You may use on-line questionnaires if the questions are the same and the requirements in WAC 296-842-140 of this chapter are met.
- You may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.



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Rule

WAC 296-842-22005 (Continued)

<i>Table 10</i> <i>WISHA Medical Evaluation Questionnaire</i>
<i>Employer Instructions:</i> <ul style="list-style-type: none">You may use on-line questionnaires if the requirements in WAC 296-842-14005 are met.You must tell your employee how to deliver or send the completed questionnaire to the health care provider you have selected.You must not review employees' questionnaires.
<i>Health care provider's instructions:</i> <ul style="list-style-type: none">Review the information in this questionnaire and any additional information provided to you by the employer.You may add questions to this questionnaire at your discretion; However, questions in Parts 1-3 may not be deleted or substantially altered.Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: phone consultations to evaluate positive responses, medical tests, and diagnostic procedures.When your evaluation is complete, send a copy of your written recommendation to the employer and employee.
<i>Employee information and instructions:</i> <ul style="list-style-type: none">Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you.Your employer or supervisor must not look at or review your answers at any time.

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Part 1-Employee Background Information

ALL employees must complete this part

Please print

1. Today's date: _____
2. Your name: _____
3. Your age (to nearest year): _____
4. Sex (circle one): Male / Female
5. Your height: _____ ft. _____ in.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include Area Code): _____
9. The best time to call you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire? _____ ☐ Yes ☐ No
11. Check the type of respirator(s) you will be using:
 - a. _____ N, R, or P filtering facepiece respirator (for example, a dust mask, OR an N95 filtering facepiece respirator).
 - b. Check all that apply.

<input type="checkbox"/> Half mask	<input type="checkbox"/> Full facepiece mask	<input type="checkbox"/> Helmet hood	<input type="checkbox"/> Escape
<input type="checkbox"/> Non-powered cartridge or canister	<input type="checkbox"/> Powered air-purifying cartridge respirator (PAPR)		
<input type="checkbox"/> Supplied-air or Air-line			
<input type="checkbox"/> Self contained breathing apparatus (SCBA): Demand or Pressure demand			
Other: _____			
12. Have you previously worn a respirator? _____ ☐ Yes ☐ No
If "yes," describe what type(s): _____



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Part 2-General Health Information

ALL employees must complete this part - Please check "Yes" or "No"

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month? ☐ Yes ☐ No
2. Have you **ever had** any of the following conditions?

Seizures (fits): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Diabetes (sugar disease): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Allergic reactions that interfere with your breathing: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Claustrophobia (fear of closed-in places): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Trouble smelling odors: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Have you **ever had** any of the following pulmonary or lung problems?

Asbestosis: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Asthma: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Chronic bronchitis: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Emphysema: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pneumonia: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Tuberculosis: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Silicosis: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pneumothorax (collapsed lung): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Lung cancer: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Broken ribs: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any chest injuries or surgeries: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any other lung problem that you have been told about: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

Shortness of breath: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shortness of breath when walking fast on level ground or walking up a slight hill or incline: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shortness of breath when walking with other people at an ordinary pace on level ground: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have to stop for breath when walking at your own pace on level ground: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shortness of breath when washing or dressing yourself: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shortness of breath that interferes with your job: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Coughing that produces phlegm (thick sputum): _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Coughing that wakes you early in the morning: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Coughing that occurs mostly when you are lying down: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Coughing up blood in the last month: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Wheezing: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Wheezing that interferes with your job: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Chest pain when you breathe deeply: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any other symptoms that you think may be related to lung problems: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No

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Part 2-General Health Information (Continued)

5. Have you **ever had** any of the following cardiovascular or heart problems?

- | | | |
|--|------------------------------|-----------------------------|
| Heart attack: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Stroke: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Angina: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Heart failure: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Swelling in your legs or feet (not caused by walking): _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Heart arrhythmia (heart beating irregularly): _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| High blood pressure: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any other heart problem that you have been told about: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

- | | | |
|--|------------------------------|-----------------------------|
| Frequent pain or tightness in your chest: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Pain or tightness in your chest during physical activity: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Pain or tightness in your chest that interferes with your job: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| In the past 2 years, have you noticed your heart skipping or missing a beat: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Heartburn or indigestion that isn't related to eating: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any other symptoms that you think may be related to heart or circulation problems: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

7. Do you **currently** take medication for any of the following problems?

- | | | |
|-----------------------------------|------------------------------|-----------------------------|
| Breathing or lung problems: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Heart trouble: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Blood pressure: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Seizures (fits): _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

8. If you have used a respirator, have you **ever had** any of the following problems? (If you have never used a respirator, check the following space and go to question 9:)

- | | | |
|--|------------------------------|-----------------------------|
| Eye irritation: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Skin allergies or rashes: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Anxiety: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| General weakness or fatigue: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any other problem that interferes with your use of a respirator? _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

9. Would you like to talk to the health care professional who will review this questionnaire about your answers? _____

☐ Yes ☐ No



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Part 3-Additional Questions for Users of Full-facepiece Respirators or SCBAs Please check "Yes" or "No"

1. Have you **ever lost** vision in either eye (temporarily or permanently): _____ ☐ Yes ☐ No
2. Do you **currently** have any of these vision problems?
 - Need to wear contact lenses: _____ ☐ Yes ☐ No
 - Need to wear glasses: _____ ☐ Yes ☐ No
 - Color blindness: _____ ☐ Yes ☐ No
 - Any other eye or vision problem: _____ ☐ Yes ☐ No
3. Have you **ever had** an injury to your ears, including a broken ear drum: _____ ☐ Yes ☐ No
4. Do you **currently** have any of these hearing problems?
 - Difficulty hearing: _____ ☐ Yes ☐ No
 - Need to wear a hearing aid: _____ ☐ Yes ☐ No
 - Any other hearing or ear problem: _____ ☐ Yes ☐ No
5. Have you **ever had** a back injury: _____ ☐ Yes ☐ No
6. Do you **currently** have any of the following musculoskeletal problems?
 - Weakness in any of your arms, hands, legs, or feet: _____ ☐ Yes ☐ No
 - Back pain: _____ ☐ Yes ☐ No
 - Difficulty fully moving your arms and legs: _____ ☐ Yes ☐ No
 - Pain or stiffness when you lean forward or backward at the waist: _____ ☐ Yes ☐ No
 - Difficulty fully moving your head up or down: _____ ☐ Yes ☐ No
 - Difficulty fully moving your head side to side: _____ ☐ Yes ☐ No
 - Difficulty bending at your knees: _____ ☐ Yes ☐ No
 - Difficulty squatting to the ground: _____ ☐ Yes ☐ No
 - Climbing a flight of stairs or a ladder carrying more than 25 lbs: _____ ☐ Yes ☐ No
 - Any other muscle or skeletal problem that interferes with using a respirator: _____ ☐ Yes ☐ No

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Part 4-Discretionary Questions

Complete questions in this part **only if** your employer's health care provider says they are necessary

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen? ☐ Yes ☐ No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions: ☐ Yes ☐ No

2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as, gases, fumes, or dust), **or** have you come into skin contact with hazardous chemicals? ☐ Yes ☐ No

If "yes," name the chemicals, if you know them:

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:
- | | | |
|---|------------------------------|-----------------------------|
| Asbestos? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Silica (for example, in sandblasting)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Tungsten/cobalt (for example, grinding or welding this material)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Beryllium? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Aluminum? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Coal (for example, mining)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Iron? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Tin? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Dusty environments? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any other hazardous exposures? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

If "yes," describe these exposures:

4. List any second jobs or side businesses you have:

5. List your previous occupations:

6. List your current and previous hobbies:

7. Have you been in the military services? ☐ Yes ☐ No
If "yes," were you exposed to biological or chemical agents (either in training or combat)? ☐ Yes ☐ No
8. Have you ever worked on a HAZMAT team? ☐ Yes ☐ No



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Part 4-Discretionary Questions (Continued)

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)? ☐ Yes ☐ No
If "yes," name the medications if you know them: _____
10. Will you be using any of the following items with your respirator(s)?
- | | | |
|---|------------------------------|-----------------------------|
| HEPA Filters: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Canisters (for example, gas masks): _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Cartridges: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
11. How often are you expected to use the respirator(s)?
- | | | |
|---|------------------------------|-----------------------------|
| Escape-only (no rescue): _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Emergency rescue only: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Less than 5 hours per week : _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Less than 2 hours per day : _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2 to 4 hours per day: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Over 4 hours per day: _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
12. During the period you are using the respirator(s), is your work effort:
- Light** (less than 200 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.
 - Moderate** (200 to 350 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.
 - Heavy** (above 350 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.)

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Part 4-Discretionary Questions (Continued)

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator: _____ ☐ Yes ☐ No

If "yes," describe this protective clothing and/or equipment:

14. Will you be working under hot conditions (temperature exceeding 77°F): _____ ☐ Yes ☐ No

15. Will you be working under humid conditions: _____ ☐ Yes ☐ No

16. Describe the work you will be doing while using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):

Name of the first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you will be exposed to while using your respirator:

19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well being of others (for example, rescue, security).



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WAC 296-842-22010

Follow these fit-testing procedures for tight-fitting respirators

Important:

- This section contains procedural requirements that apply during actual fit testing.
- See WAC 296-842-150 of this chapter for fit-testing requirements that apply to your overall program.



Exemption:

This section does not apply to employees who:

- Voluntarily use respirators
- or**
- Are required to use mouthpiece respirators.

You must

- Conduct fit testing according to all of the following:
 - Follow the procedure in **Table 11** to choose a respirator for fit testing:
 - Prior to conducting fit tests**and**
 - Any time your employee must select a different respirator such as when a previously selected respirator fails a test
 - Select and follow at least one of the following fit test procedures:
 - Qualitative fit-test procedures:
 - Isoamyl acetate vapor (IAA, banana oil) in **Table 12**
 - Saccharine aerosol in **Table 13**
 - Bitrex™ aerosol in **Table 14**
 - Irritant smoke in **Table 15**
 - Quantitative fit-test procedures:
 - Ambient aerosol condensation nuclei counter such as the Portacount™, in **Table 16**
 - Controlled negative pressure (CNP) such as the FitTester 3000™, in **Table 17**
 - Generated aerosol in **Table 18**

– Continued–

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Rule

WAC 296-842-22010 (Continued)

You must

- Make sure employees perform the appropriate fit test exercises listed in **Table 19**.
- Clean and maintain equipment according to the manufacturer's instructions.
- Make sure during fit testing employees wear any safety equipment that could:
 - Interfere with respirator fit**and**
 - Be worn in the workplace. For example, chemical splash goggles.
 - Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If you find such conditions, do **not** conduct fit testing for that individual.



Note:

Examples of conditions that may interfere with the respirator seal or valve functions include:

- Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function
- Temple bars of corrective eyewear or headgear that extend through the face seal area.



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Table 11
Procedure for Choosing a Respirator for Fit Testing

1. Inform the employee:

- To choose the most comfortable respirator that provides an adequate fit
- That each respirator sample represents a different size and, if more than one model is supplied, a different shape
- That if fitted and used properly, the respirator chosen will provide adequate protection

2. Provide a mirror and show the employee how to:

- Put on the respirator
- Position the respirator on the face
- Set strap tension

Note:

This instruction doesn't take the place of the employee's formal training since it's only a review.

3. Review with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.

- Tell the employee the respirator should be comfortable while talking or wearing eye protection.

4. Have the employee hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:

- Reject any facepiece that clearly doesn't feel comfortable or fit adequately
- or**
- Choose which facepiece is most acceptable and which are less acceptable, if any

Note:

- Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that is acceptable and fits correctly.
- To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.

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Table 11 (Continued)
Procedure for Choosing a Respirator for Fit Testing

5. **Have the employee wear** the most acceptable respirator for **at least** 5 minutes to evaluate comfort and fit. Do **all** of the following during this time:
- Ask the employee to observe and comment about the comfort and fit:
 - Around the nose, cheeks, and other areas on the face
 - When talking or wearing eye protection.
 - Have the employee put on the respirator and adjust the straps until they show proficiency.
 - Evaluate the respirator's general fit by checking:
 - Proper chin placement
 - Properly tightened straps (do **not** over tighten)
 - Acceptable fit across the nose bridge
 - Respirator size; it must span the distance from nose to chin
 - To see if the respirator stays in position
 - Have the employee complete a successful seal check as specified in WAC 296-842- 22025 of this chapter
 - Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths while **slowly**:
 - Moving their head from side-to-side
 - and**
 - Up and down
6. **If the employee finds the respirator unacceptable**, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.
7. **Before starting the fit test**, you must:
- Describe the fit test including screening procedures, employee responsibilities, and test exercises **and**
 - Make sure the employee wears the respirator **at least** 5 minutes



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Table 12 Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p>Important:</p> <ul style="list-style-type: none">• This is a qualitative fit-test (QLFT) procedure.• The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor.<ul style="list-style-type: none">- Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:<ul style="list-style-type: none">• Prepare all solutions in a location separate from screening and test areas.• Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air.- Always use odor-free water, for example, distilled or spring water that is 25°C (77°F).• Isoamyl acetate is also known as isopentyl acetate.
Screening Preparations
<p>Important:</p> <p>Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.</p> <ol style="list-style-type: none">1. Choose an appropriate location to conduct screening.<ul style="list-style-type: none">• Conduct screening and tests in separate well-ventilated rooms.2. Prepare a stock solution at least weekly as follows:<ul style="list-style-type: none">• Add one milliliter (ml) of pure IAA to 800 ml of odor free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette.• Seal the jar with the lid and shake it for 30 seconds.• Clean the dropper or pipette3. Prepare the odor test solution daily as follows:<ul style="list-style-type: none">• Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper• Seal the jar with the lid and shake it for 30 seconds.• Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium.• Label this jar so you know the contents but the employee cannot know its contents, for example, "1." <p>Note:</p> <p>To maintain the integrity of the test, use labels that peel off easily and periodically switch the labels.</p>

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Table 12 (Continued)
Isoamyl Acetate (Banana Oil) Vapor Test Procedure

Screening Preparations (Continued)

4. Prepare a "test blank" solution as follows:
 - Add 500 ml of odor-free water to a one liter glass jar with a metal lid
 - Seal the jar
 - Label the jar so you know the contents but the employee can't know its contents
5. Type or neatly print the following instructions on a card and place it on the table in front of the 2 test jars:

*"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one **also** contains a small amount of banana oil.*

Make sure the lid is secure then pick up a jar and shake it for 2 seconds. Open the jar and sniff at the opening. Repeat this for the second jar.

Tell the individual conducting the fit test which jar contains banana oil. "

Test Preparations

6. Choose an appropriate location to conduct fit testing.
 - Conduct screening and tests in separate well-ventilated rooms.
7. Assemble the fit test enclosure in the room.
 - Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other lightweight rigid material **or** construct a similar enclosure using plastic sheeting.
 - Hang the frame with the plastic covering so the top of the enclosure is about 6 inches above the employee's head.
 - Attach a small hook inside top center of the enclosure.
 - Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it.
8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.
9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material **and** 0.75 ml of pure IAA. Do **not** apply IAA yet.

Note:

As an alternative to using the paper towel, you may use an IAA test swab **or** ampoule if it has been demonstrated to generate an equivalent test concentration.



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Table 12 (Continued) Isoamyl Acetate (Banana Oil) Vapor Test Procedure	
Test Preparations	
10.	<p>Have the employee, while not wearing a respirator, follow the instructions on the card provided.</p> <ul style="list-style-type: none"> If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11). If the employee is not able to correctly identify the jar containing IAA, you must stop and use a different fit test protocol.
Test	
11.	<p>Before entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.</p>
12.	<p>Wet the paper towel with 0.75 ml of pure IAA and fold it in half.</p>
13.	<p>Pass the paper towel to the employee inside the enclosure and instruct the employee to hang it on the hook at the top of the enclosure.</p>
14.	<p>Wait 2 minutes for the IAA vapor to fill the enclosure.</p> <ul style="list-style-type: none"> While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test. You may also demonstrate the test exercises.
15.	<p>Have the employee perform the appropriate fit test exercises in Table 19.</p> <ul style="list-style-type: none"> If the employee does not detect IAA while performing test exercises, the fit test has been passed. Proceed as follows: <ul style="list-style-type: none"> Before leaving the enclosure, have the employee break the respirator seal and inhale. If they detect IAA, the test is valid. When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests. The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination. If the employee detects IAA during any test exercise, the fit test has failed. Stop and have the employee do the following: <ul style="list-style-type: none"> Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity. Select another respirator Repeat screening and testing. <ul style="list-style-type: none"> At this stage, if the employee fails the screening part of this procedure, the employee can repeat it after waiting at least 5 minutes for odor sensitivity to return.

Required
Procedures



Required Procedures for Respiratory Protection Program

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Table 13
Saccharin Aerosol Test Procedure

Screening Preparations

Important:

- This is a qualitative fit-test (QLFT) procedure.
- Taste threshold screening determines whether the employee being tested can detect the taste of saccharin.
 - The employee must **not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening.
 - Nebulizers must be thoroughly rinsed in water and shaken dry:
 - Each morning and afternoon
 - or**
 - At least every 4 hours
 - You may use commercially prepared solutions if they meet the requirements in this procedure.

1. Obtain a test enclosure (hood) that meets the following specifications:

- 12 inches in diameter by 14 inches tall
- A clear front portion
- Enough space inside to allow free movement of the head when a respirator is worn
- A $\frac{1}{4}$ inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.

Note:

- An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications.
- This enclosure can also be used for testing.

2. Obtain and assemble 2 clean DeVilbiss Model 40 Inhalation Medication Nebulizers **or** equivalent.

3. Prepare the screening solution as follows:

- Dissolve 830.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water
- or**
- If you have already prepared the fit test solution, you can make the screening solution by adding one ml of this solution to 100 ml of distilled water.

4. Add about 1 ml of the screening solution to one of the nebulizers.

- Mark this nebulizer to distinguish it from the one to be used for fit testing.



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Table 13 (Continued) Saccharin Aerosol Test Procedure	
Test Preparations	
5.	Prepare the fit test solution as follows: <ul style="list-style-type: none"> Add 83.0 grams of sodium saccharin to 100 ml of warm water.
6.	Add about 1 ml of the test solution to the second nebulizer. <ul style="list-style-type: none"> Mark this nebulizer to distinguish it from the one used for screening.
7.	Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.
Screening	
8.	Have the employee, while not wearing a respirator, put on the test enclosure
9.	Instruct the employee to: <ul style="list-style-type: none"> Breathe through a slightly open mouth with tongue extended during screening and testing Immediately report when a sweet taste is detected
10.	Insert the nebulizer into the front hole of the test enclosure and administer saccharin as follows: <ul style="list-style-type: none"> Direct the nozzle away from the employee's nose and mouth Complete 10 squeezes in rapid succession. Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.
11.	Ask the employee if a sweet taste is detected. <ul style="list-style-type: none"> If yes, screening is completed. Proceed to conduct testing, Step 14, after you: <ul style="list-style-type: none"> Ask the employee to remember the taste for reference during the fit test. Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed. If no, screening must continue. Proceed to Step 12.
12.	Repeat with 10 more squeezes. Then follow Step 11 again; except this time note the employee's taste threshold as "20" if a sweet taste is reported. <ul style="list-style-type: none"> If a sweet taste is still not detected, repeat with 10 more squeezes and follow Step 11 one last time; except this time note "30" for the taste threshold if a sweet taste is reported.
13.	If no sweet taste is reported after 30 squeezes, you must stop and choose a different fit test protocol for the employee.

Required
Procedures



Required Procedures for Respiratory Protection Program

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Table 13 (Continued)
Saccharin Aerosol Test Procedure

Test

Important:

- Periodically check nebulizers to make sure they do not clog during use. A test is **not** valid if the nebulizer is clogged at the end of the test.
- 14.** Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).
- 15.** Instruct the employee to immediately report if a sweet taste is detected.
- 16.** Insert the nebulizer into the front hole of the test enclosure **and** administer the same number of squeezes, either 10, 20, or 30, as noted during screening.
- 17.** Have the employee perform the appropriate fit test exercises as described in Table 19. During this step:
 - Replenish the aerosol in the hood **every** 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15.
 - The employee must report if a sweet taste is detected:
 - If **no** saccharin is tasted, the test has been **passed**.
 - If saccharin is tasted the test has **failed**, have the employee select another respirator **and**
 - Repeat screening and testing



Required Procedures for Respiratory Protection Program

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Table 14
Bitrex™ Aerosol Test Procedure

Important:

- This is a qualitative fit-test (QLFT) procedure.
- Bitrex (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children should not drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers.
- The employee must **not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the fit test.

Screening Preparations

Important:

- Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex.
- Nebulizers must be thoroughly rinsed in water and shaken dry:
 - Each morning and afternoon
 - or**
 - At least every 4 hours
- You may use commercially prepared solutions if they meet the requirements in this procedure.

1. Obtain a test enclosure that meets the following specifications:

- 12 inches in diameter by 14 inches tall
- A clear front portion
- Enough space inside the front to allow free movement of the head when a respirator is worn
- $\frac{3}{4}$ inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.

Note:

- An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications.
- This enclosure can also be used for testing.

2. Obtain and assemble 2 clean DeVilbiss Model 40 Inhalation Medication Nebulizers **or** equivalent:

3. Prepare the screening solution as follows:

- Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water
- Dissolve 13.5 milligrams of Bitrex in the salt solution.

4. Add about 1 ml of the screening solution to one of the nebulizers.

- Mark this nebulizer to distinguish it from the one to be used for fit testing.

Required
Procedures



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Table 14 (Continued)
Bitrex™ Aerosol Test Procedure

Test Preparations

5. Prepare the fit test solution.
 - Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water
 - Add 337.5 milligrams of Bitrex to the warmed salt solution.
6. Add about 1 ml of the test solution to the second nebulizer.
 - Mark this nebulizer to distinguish it from the one used for screening.
7. Have particulate filters ready for the employee's chosen respirator or have filtering facepiece respirators ready.

Screening

Important:

The employee must **not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the screening and test.

8. Have the employee, while **not** wearing a respirator, put on the test enclosure.
9. Instruct the employee to:
 - Breathe through a slightly opened mouth with tongue extended during screening **and** testing
 - Immediately report when a bitter taste is detected
10. Insert the nebulizer into the front hole of the test enclosure **and** administer Bitrex as follows:
 - Direct the nozzle away from the employee's nose and mouth
 - Complete 10 squeezes in rapid succession.
 - Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.
11. Ask the employee whether a bitter taste is detected.
 - If **yes**, screening is completed. Proceed to conduct testing, Step 14, **after** you:
 - Ask the employee to remember the taste for reference during the fit test.
 - Note the employee's taste threshold as "10", regardless of the number of squeezes actually completed.
 - If **no**, screening must continue. Proceed to Step 12.
12. Repeat with 10 more squeezes. Then follow Step 11 again; **except** this time note the employee's taste threshold as "20" **if** a bitter taste is reported.
 - If a bitter taste is still **not** detected repeat with 10 more squeezes and follow Step 11 one last time; **except** this time note "30" for the taste threshold **if** a bitter taste is reported.
13. If **no** bitter taste is reported after 30 squeezes, you must **stop** and choose a different fit test protocol for the employee.



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Table 14 (Continued)
Bitrex™ Aerosol Test Procedure

Test
<p>14. Have the employee attach respirator filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.</p> <p>15. Instruct the employee to:</p> <ul style="list-style-type: none"> Breath through a slightly opened mouth with tongue extended during screening and testing Immediately report when a bitter taste is detected <p>16. Insert the nebulizer into the front hole of the test enclosure and administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> Replenish the aerosol in the hood every 30 seconds using ½ the number of squeezes used in Step 16, either 5, 10, or 15. The employee must report if a bitter taste is detected: <ul style="list-style-type: none"> If no Bitrex is tasted, the test has been passed. If Bitrex is tasted the test has failed. Have the employee: <ul style="list-style-type: none"> Select another respirator and Repeat all screening and testing steps

Required
Procedures



Required Procedures for Respiratory Protection Program

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Table 15
Irritant Smoke (Stannic Chloride) Test Procedure

Important:

Do not use a test enclosure or hood for this fit test!

- This is a qualitative fit-test (QLFT) procedure.
- During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages.
- Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke.
- Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.

Screening and Test Preparations

Important:

Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke **and** whether any gross facepiece leakage is detected.

1. Obtain only stannic chloride (ventilation) smoke tubes, **and** an aspirator squeeze bulb **or** use a low flow air pump set to deliver 200 milliliters of air flow per minute.
2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high efficiency particulate air (HEPA) filters.

Screening

Important:

When performing sensitivity screening checks use only the **minimum** amount of smoke necessary to elicit a response from the employee.

3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages **and** instruct the employee to keep eyes closed while exposed.
4. Break both ends of the ventilation smoke tube **and** fit a short piece of plastic tubing, for example, 2-to-6 inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.
5. While the employee is **not** wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties.
 - Carefully direct a small amount of irritant smoke toward the employee.



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Table 15 (Continued)
Irritant Smoke (Stannic Chloride) Test Procedure

Test

6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.
7. Remind the employee to keep eyes closed during testing.
8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:
 - Begin at least 12 inches from the facepiece and move the smoke around the whole perimeter of the mask.
 - Gradually make 2 more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator.
 - **Stop** at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening.
9. Have the employee perform appropriate fit test exercises in Table 19 if the employee has **not** had an involuntary response such as evidence of coughing, flinching, or other response, or detected smoke in the facepiece.
 - Continue to direct smoke from a distance of 6 inches around the facepiece perimeter.
 - If smoke is detected at any time the test has failed. A different respirator must be chosen and tested, starting with sensitivity screening.
 - If no smoke is detected proceed to Step 10.
10. Have the employee remove the respirator and perform another sensitivity screening check as follows:
 - Continue to use the smoke tube used for fit testing.
 - Carefully direct a **small** amount of irritant smoke toward the employee.
 - The test has been passed if the employee responds to the smoke.

The fit test is voided **if** the employee does **not** respond to the smoke.

Required
Procedures



Required Procedures for Respiratory Protection Program

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Table 16
Ambient Aerosol Condensation Nuclei Counter (Portacount™)
Test Procedure

Important:

- This is a quantitative (QNFT) fit-test procedure.
- This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises.
- Particles in the ambient air are used as the test aerosol.

Test Preparations

1. Obtain a test instrument such as a Portacount™.
2. Have probed respirators available for each respirator model and size the employer uses, **or** have a sampling adapter available if the employee's actual or chosen respirator will be tested.

Note:

- A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, **and** can only be used for fit testing purposes.
- Contact TSI Inc., **or** the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters.

3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass **or** fail criterion is programmed to the following **minimum** performance levels:
 - For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level.
 - For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level.
4. Have high efficiency particulate air (HEPA) filters, **or** other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.
 - If you will use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.



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Table 16 (Continued)
Ambient Aerosol Condensation Nuclei Counter (Portacount™)
Test Procedure

Test

5. Properly attach the sampling line to the facepiece probe or sampling adapter.
6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator 5 minutes **before** the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:
 - Proper chin placement
 - Properly tightened straps (do **not** over tighten)
 - Acceptable fit across the nose bridge
 - Respirator size. It must span the distance from nose to chin
 - To see if the respirator stays in position

Note:

Wearing the respirator for 5 minutes permits the employee to make certain the respirator is comfortable **and** allows for purging of ambient particles trapped inside the facepiece.

7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If **no** leakage is detected proceed to Step 8. If leakage is detected:
 - Determine the cause
and
 - If leakage is due to a poorly fitting facepiece have the employee:
 - Choose another respirator size or model
and
 - Start again at Step 6.
8. Start the fit test cycle.
 - Follow the manufacturer's instructions for operating the test instrument.
 - Have the employee perform the appropriate fit test exercises in Table 19.
 - The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed.
 - The test has been **passed** if the overall fit factor is at least 100 for a half facepiece, **or** 500 for a full facepiece.
 - The test has **failed** if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.

Note:

If the test has failed, have the employee select another respirator model or size following Table 11 **and** repeat this procedure.

Required
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Required Procedures for Respiratory Protection Program

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Table 17
Controlled Negative Pressure (CNP) Test Procedure

Important:

- This is a quantitative fit-test (QNFT) procedure.
- This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure **after** various premeasurement activities.
- Measurements occur while employees remain still **and** hold their breath for 10 seconds.
- No test aerosols are used. Respirator cartridges aren't needed for this test.

Test Preparations

1. Make sure the individual conducting the fit test is thoroughly trained to perform this test.
2. Obtain a CNP test instrument such as a FitTester 3000™. Make sure:
 - Defaults are set at:
 - 15mm (-0.58 inches) of water test pressure
 - and**
 - A modeled inspiratory flow rate of 53.8 liters per minute
 - It has an effective audio warning device that signals when employees fail to hold their breath

Note:

- You aren't required to obtain test recording and printing equipment such as computers **or** printers. Hand recording results is acceptable.
- To see default settings, check the instrument's "REDON protocol" to see default settings.

3. Obtain facepiece adapters appropriate for each test respirator.

Note:

- Adapters are either a one-piece (for SCBA facepieces), **or** 2-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure.
- To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, **or** the respirator manufacturer.



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Table 17 (Continued) Controlled Negative Pressure (CNP) Test Procedure	
Test	
<p>Important:</p> <p>After the test, you must ask the employee about the comfort of the respirator and if the respirator has become unacceptable, another size or model must be chosen and tested.</p> <ol style="list-style-type: none"> 4. Explain the test procedure to the employee. 5. Train the employee on how to hold a breath for at least 20 seconds. 6. Prepare the respirator for the fit test as follows: <ul style="list-style-type: none"> • Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it. • Replace cartridges, if present, with the manifold and breathing valve adapter <ul style="list-style-type: none"> - For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve attachment. • Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions. 7. Have the employee put on, adjust, and seal check the respirator. 8. Turn on the instrument and have the employee stand and perform the fit test exercises in Table 19. 9. Interpret the test results: <ul style="list-style-type: none"> • The test is passed if the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece. • The test has failed if the fit factor is less than 100 for a half facepiece; 500 for a full facepiece. <ul style="list-style-type: none"> - If the test has failed you must have the employee select another respirator model or size following the steps in Table 11 and repeat this procedure, starting at Step 6. 	

Required
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Table 18
Generated Aerosol Test Procedure

Important:

- This is a quantitative (QNFT) fit-test procedure.
- In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises.
- Special equipment is needed to generate, disperse, detect, and measure test aerosols.

Test Preparations

1. Test aerosol.
 - Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride.
2. Instrumentation.
 - Do **all** the following:
 - Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates.
 - Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation.
 - Select a sampling instrument that allows for a computer record or strip chart record to be created.
 - The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000.

Note:
Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.

 - Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.
3. Test enclosure.
 - Do **all** the following:
 - Make sure the enclosure is equipped and constructed to effectively:
 - Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **all** employees freedom of movement during testing **without** disturbing the test concentration or measurement instrument.
 - Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air.
 - Allow the individual conducting the fit test to view the employee during the test.
 - Make sure the tubing used to collect samples from the enclosure **and** respirator is the same material, diameter, **and** length. This makes the effect of aerosol loss caused by deposition in each sample line equal.
 - If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.



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Table 18 (Continued)
Generated Aerosol Test Procedure

Test Preparation

4. Prepare test respirators.
 - Do **all** the following:
 - Inspect test respirators regularly for missing parts **and** damage
 - Keep test respirators in proper working order
 - Make sure in-mask sampling probes are:
 - Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth
 - and**
 - The probe extends inside the facepiece at least $\frac{1}{4}$ inch.
 - Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **not**:
 - Block air flow into the sampling line
 - Leak
 - Interfere with the respirator's fit or performance
 - Have high efficiency particulate air (HEPA) filters OR P100 series filter available.
 - Replace filters when increased breathing resistance is detected **or** when the test agent has altered the filter material's integrity.

Test

Important:

- Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration.
 - If a single peak penetration exceeds 5% for half facepieces **or** 1% for full facepieces:
 - stop the test
 - and**
 - Have the employee select another respirator for testing.
5. Have the employee attach filters, put on, adjust, and seal check the respirator.
 - Be sure to crimp the sampling line to avoid pressure leaks during the seal check.
 - and**
 - Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **not** over-tighten.
 6. **Optional Step.** To save time conduct a screening test to quickly identify poorly fitting respirators

Note:

You may use a qualitative screening test **or** an ambient aerosol condensation nuclei counter instrument in the count mode.

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Table 18 (Continued)
Generated Aerosol Test Procedure

Test (Continued)

7. Make sure test aerosol concentration is reasonably stable.
 - If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **after** the employee enters the enclosure.
8. Have the employee enter the test enclosure and connect the respirator to the sample lines.
9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
 - Make sure the peak penetration does **not** exceed 5% for half facepieces, **or** 1% for full facepieces.
10. Have employee perform the appropriate fit test exercises in Table 19.
 - Do **not** adjust the respirator once exercises begin.
11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
 - **Passed** if the minimum fit factor of 100 for half facepieces or 500 for full facepieces is obtained.
 - or**
 - If a passing fit factor is **not** obtained, the test has **failed** and you must have the employee select and test another respirator.

Calculations

Important:

- Do **not** count the grimace exercise measurements during these calculations.
 - Take into account the limitations of instrument detection when determining fit factors.
12. Calculate individual fit factors for **each** exercise by applying the following:
 Exercise Fit Factor (ffE) =
$$\frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$$
 - To determine the average test enclosure concentration use one of the following methods:
 - Arithmetic average of the concentration before and after each test (an average of 2 values per entire test)
 - Arithmetic average of concentration before and after each exercise (an average of 2 values per exercise).
 - True average measured continuously during the respirator sample
 - Determine the test aerosol concentration inside the respirator in one of the following ways:
 - Average peak penetration values. Determine aerosol penetration for each exercise by:
 - Using integrators or computers that calculate the actual test agent penetration
 - or**
 - Average the peak heights shown on the strip chart recording, graph, or by computer integration.
 - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value.
 - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.
 13. Using individual exercise fit factors (ffE) calculate the overall fit factor by doing **all** of the following:
 - Convert each exercise fit factor to a penetration value
 - Determine the average penetration value
 - Convert the average penetration value back to a fit factor
 - or**
 - Use this equation to calculate the **overall fit factor**:
 Overall fit factor =
$$\frac{n}{1/\text{ffE1} + 1/\text{ffE2} + 1/\text{ffE3} + \dots + 1/\text{ffEn}}$$



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Table 19
Fit Test Exercises

Important:

- This list applies when you use any fit test.
- Employees tested must perform **all** exercises marked with an "X" as described for the fit test procedure used.
 - Once exercises begin, any adjustments made void the test **and** you must begin again.
 - After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing.
- When the Controlled Negative Pressure Procedure (CNPP) is used **stop and repeat** the test if the employee adjusts the respirator **or** takes a breath and fails to hold it for 10 seconds.
- Controlled negative pressure tests conducted according to the method published in 29 CFR 1910.134, Appendix A are an acceptable alternative to the method outlined below.

Description of Required Fit Test Exercises	Fit Test Procedures		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
Normal breathing <ul style="list-style-type: none"> • Breathe normally, while standing for one minute 	X	X	
Deep breathing <ul style="list-style-type: none"> • Breathe slowly and deeply while standing for one minute. • Take caution to avoid hyperventilating 	X	X	
Head side to side <ul style="list-style-type: none"> • Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale. • Be careful to not bump the respirator 	X	X	
Head up and down <ul style="list-style-type: none"> • Slowly move head up and down while standing for one minute, inhaling in the up position. • Be careful to not bump the respirator. 	X	X	

Required Procedures



Required Procedures for Respiratory Protection Program

WAC 296-842-220

Rule



Table 19 (Continued) Fit Test Exercises			
Description of Required Fit Test Exercises	Fit Test Procedures		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
Talking <ul style="list-style-type: none"> Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose one of the following: <ul style="list-style-type: none"> Read from a prepared text such as the Rainbow Passage* Count backward from 100 Recite a memorized poem or song 	X	X	
Grimace <ul style="list-style-type: none"> Smile or frown for 15 seconds 		X	
Bending over <ul style="list-style-type: none"> Bend over to touch toes while standing. Repeat at a comfortable pace for one minute or Jog in place for one minute if the test enclosure, such as a hood, doesn't permit bending over 	X	X	
Normal breathing <ul style="list-style-type: none"> Breathe normally while standing for one minute 	X	X	
Face forward <ul style="list-style-type: none"> Premeasurement activity: Stand and breath normally, without talking Measurement position: Face forward while holding breath for 10 seconds 			X
Bending over <ul style="list-style-type: none"> Premeasurement activity: While standing, bend over to touch toes Measurement position: Hold the bending position with face parallel to the floor while holding breath for 10 seconds 			X

Required Procedures for Respiratory Protection Program

WAC 296-842-220

Rule

Table 19 (Continued) Fit Test Exercises			
Description of Required Fit Test Exercises	Fit Test Procedures		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
Head shaking <ul style="list-style-type: none"> Premeasurement activity: Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRR" loudly Measurement position: Face forward, while holding breath for 10 seconds 			X
Redon-1 <ul style="list-style-type: none"> Premeasurement activity: Remove the respirator completely and put it back on Measurement position: Face forward while holding breath for 10 seconds 			X
Redon-2 <ul style="list-style-type: none"> Repeat the premeasurement activity and measurement position described in Redon-1 			X
<p>* The Rainbow Passage:</p> <p>"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."</p>			

Required Procedures



Required Procedures for Respiratory Protection Program

WAC 296-842-220

Rule

WAC 296-842-22015

Follow procedures established for cleaning and disinfecting respirators

- Follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them

Table 20
Respirator Cleaning Procedure

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. <ul style="list-style-type: none"> Discard or repair any defective parts.
2.	Wash components in warm (43°C [110°F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. <ul style="list-style-type: none"> A stiff bristle (not wire) brush may be used to help remove the dirt. If the detergent or cleaner doesn't contain a disinfecting agent, respirator components should be immersed for 2 minutes in one of the following: <ul style="list-style-type: none"> A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F) A solution of iodine (50 parts per million iodine). Make this in 2 steps: <ul style="list-style-type: none"> First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately. Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer
3.	Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably, running water. <p>Note: The importance of thorough rinsing can't be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.</p>
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. <ul style="list-style-type: none"> Replace filters, cartridges, and canisters, if necessary (for testing)
7.	Test the respirator to make sure all components work properly.



Required Procedures for Respiratory Protection Program

WAC 296-842-220

Rule

WAC 296-842-22020

Follow procedures established for seal checking respirators

Important:

- User seal checks are **not** a substitute for fit tests. See WAC 296-842-22010 for fit test procedures.
- You may use a seal check procedure recommended by the respirator manufacturer **instead** of the procedure outlined in Table 21 **if** you can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.

You must

- Make sure employees perform a user seal check as outlined in Table 21, **each time** the respirator is worn, to make sure the seal is adequate.

Required
Procedures



– Continued–

Required Procedures for Respiratory Protection Program

WAC 296-842-220

Rule

WAC 296-842-22020 (Continued)

Table 21
User Seal Check Procedure

Important Information for Employees:

- You need to conduct a seal check each time you put your respirator on before you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems.
- The procedure below has 2 parts; a positive pressure check and a negative pressure check. You must complete both parts each time. It should only take a few seconds to perform, once you learn it.
 - If you can't pass both parts, your respirator is not functioning properly, see your supervisor for further instruction.

Positive Pressure Check:

1. Remove exhalation valve cover, if removable.
2. Cover the exhalation valve completely with the palm of your hand while exhaling gently to inflate the facepiece slightly.
3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and no outward leakage).
 - If you detect no leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check .
 - If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.

Negative Pressure Check:

4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands while inhaling gently to collapse the facepiece slightly.
 - If you can't use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use:
 - Filter seal(s) (if available)
 - or**
 - Thin rubber gloves
5. Once the facepiece is collapsed, hold your breath for 10 seconds **while** keeping the inhalation openings covered.
6. The facepiece should remain slightly collapsed (indicating negative pressure and **no** inward leakage).
 - If you detect **no** evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator.
 - If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat **both** the positive and negative fit checks.

